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Forest Research Notes

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OBSERVATIONS ON A HYBRID POPLAR TEST PLANTING IN WEST VIRGINIA

Hybrid poplars, crosses between European and American Aigeiros poplars, have been grown in Europe for about 200 years. The rapid growth and high productivity of some of these hybrids on sites to which they are adapted has stimulated interest in poplar growing in this country. And demand for these poplars is developing in many parts of the United States.[1]

As part of a region-wide test of the Northeastern Station's hybrids, dormant cuttings from 50 hybrid poplar clones were out-planted in 1951 in four replicate plots in north-central West Virginia: two in the U. S. Forest Service Nursery at Parsons and two in an old field on the Horseshoe Run bottom, 8 miles northeast of Parsons.

The plantings were on alluvial soils derived from acid sandstones and shales. Pope gravelly silt loam at Horseshoe Run is a well-drained soil. The Philo sandy loam at the Parsons nursery is a moderately well-drained alluvial soil with evidence of impeded drainage at a depth of 2 feet. Both soils have a pH of about 5.5.

Each plot consisted of a square of 16 cuttings planted at a spacing of 4 x 4 feet. The sites were plowed prior to planting, and they were cultivated three times the first growing season. No further care was given these plantings. The close spacing, without thinning, may have slowed the growth rate. Therefore, heights reported here are probably not so great as those that might have developed under intensive management.

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[1]Schreiner, Ernst J. Production of poplar timber in Europe and its significance and application in the United States. U. S. Dept. Agr. Agr. Handbook 150. 124 pp., illus. 1959.

Table 1.--Clone numbers and parentage of material used in the Parsons Nursery and Horseshoe Run hybrid poplar planting, 1951

Clone numbers	Parentage[1]
NE-2, -5, -279, -282	P. nigra L. x P. laurifolia Ledeb.
NE-9, -10	" " x P. trichocarpa Torr. & Gray
NE-12, -301	" " cv. Betulifolia x P. trichocarpa
NE-14	" " cv. Charkowienses x P. deltoides Bartr.
NE-18, -21	" " " " x P. nigra cv. Caudina
NE-29, -322	" " " " x P. trichocarpa
NE-31	" " " " x Unidentified cottonwood
NE-305	" " " " x P. nigra cv. Plantierensis
NE-33	P. deltoides cv. Angulata x P. x berolinensis Dipp.
NE-34, -259	" " " " x P. nigra cv. Incrassata
NE-251, -256, -258	" " " " x P. trichocarpa
NE-261	" " " " x P. nigra cv. Plantierensis
NE-264	" " " " x P. nigra cv. Volga
NE-41, -42	P. maximowiczii Henry x P. trichocarpa
NE-43, -44, -46, -47, -48, -49, -50	" " x P. x berolinensis
NE-51, -52	" " x P. nigra cv. Plantierensis
NE-53	" " x P. nigra cv. Claudina
NE-200, -205, -206, -209 -212, -213, -219	P. deltoides x P. trichocarpa
NE-223, -224, -227	" " x P. nigra cv. Caudina
NE-229	" " x P. x berolinensis
NE-235	" " x P. x canadensis Moench cv. Incrassata
NE-239	" " x P. nigra cv. Volga
NE-241	" " x P. nigra cv. Plantierensis
NE-333	P. simonii Carr. x P. x berolinensis

[1] Full names are in accordance with the International Code of Nomenclature for Cultivated Plants.

Clone numbers and the parentage of the hybrids used in this study are shown in table 1. The hybrids tested were derived from parents in two sections of the genus Populus: Aigeiros and Tacamahaca.

Measurements used in the appraisals that follow were made at Horseshoe Run in 1959, and at Parsons in 1957, just before the planting at the latter place was removed to make room for nursery expansion. Observations were made at both sites in 1957 on incidence of leaf rust, insect attack, and cankers.

Heights of the four tallest trees on each plot were measured. Then the two 4-tree sets representing the two replicates of each clone at each site were combined and average heights were calculated. The comparisons below are based on these 8-tree averages. An example of the variation in growth among clones is shown in figure 1.

Table 2 shows height growth of the 10 best clones at the time of the latest measurements at each site, i.e., 9-year growth at Horseshoe Run and 7-year growth at the nursery. Three clones--NE-46 and NE-50 at Horseshoe Run and NE-41 at the nursery--had averaged more than 4.5 feet per year. Although rankings among the 10 best clones varied between sites, the lists were in reasonably close agreement: 7 clones are common to both lists. But 3 clones on each

list are not common to both, so the two lists each total 13 clones.

Table 2 also gives the 7-year growth measurements at Horseshoe Run for the 13 clones. These data were included for comparison with the 7-year growth at the nursery, and to show that growth rates at Horseshoe Run during the last 2 years were considerably higher than the 7-year averages. Had the nursery plantation been continued, similar increases in growth rate probably would have occurred there too.

It is noteworthy that all 13 of these faster growing clones listed in table 2 have at least one parent in the section Tacamahaca.

The clones that failed or grew very poorly (table 3) usually did so on both sites. It would seem that all these clones--certainly those failing at both sites--should not be considered for planting on similar soils in this area.

In general, the clones on the moderately well-drained soil at the Parsons Nursery showed a higher incidence of canker than those on the well-drained soil at Horseshoe Run. However, there was no apparent pattern in the incidence of leaf rust and insect attack.

Some beaver damage occurred at Horseshoe Run in 1952-53. This damage is difficult to assess. Where the beaver did not cut all the trees on a plot, growth of the remaining

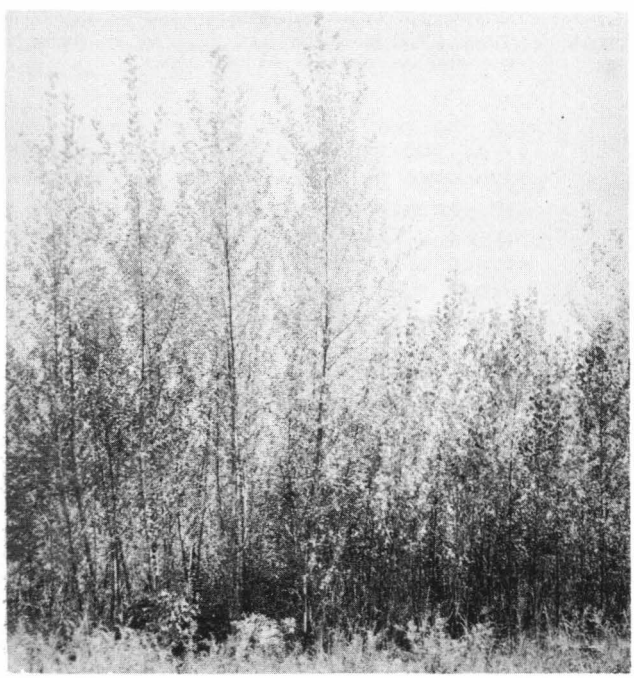

Figure 1.--*After 9 years, clone NE-43 (left) had grown to an average height of 38 feet. This contrasts sharply with the poorer clone NE-241 (right), which averaged only about half that height.*

ones may have been stimulated by the temporary reduction in competition caused by the partial cutting. Some of the clones that were most seriously damaged by beaver in 1953 were among the best in appearance in 1959. In several instances a plot was cleared by the beaver, but the stumps of the better adapted clones put out such vigorous shoots that very little height growth was lost.

Table 2.--Height growth of the 10 fastest growing clones at each site, plus 3 clones at each site that were among the 10 best at the other site[1]

Clone number	7-year growth				9-year growth	
	Parsons Nursery		Horseshoe Run		Horseshoe Run	
	Average total growth	Mean annual growth	Average total growth	Mean annual growth	Average total growth	Mean annual growth
	Feet	Feet/year	Feet	Feet/year	Feet	Feet/year
NE-41	33.2	4.7	21.9	3.1	34.4	3.8
42	25.6	3.7	(20.5)	(2.9)	(32.0)	(3.5)
43	(18.9)[2]	(2.7)	23.1	3.3	38.0	4.2
46	24.2	3.5	24.2	3.5	41.8	4.6
47	19.2	2.7	21.0	3.0	33.6	3.7
48	20.2	2.9	(16.9)	(2.4)	(26.4)	(2.9)
49	23.2	3.3	24.0	3.4	34.0	3.8
50	22.8	3.2	26.6	3.8	43.8	4.9
51	24.5	3.5	20.9	3.0	33.8	3.8
52	23.8	3.4	19.6	2.8	34.0	3.8
53	19.9	2.8	(21.1)	(3.0)	(32.0)	(3.5)
206	(16.0)	(2.3)	21.2	3.0	32.2	3.6
256	(14.5)	(2.1)	21.2	3.0	32.1	3.6

[1]Selections of 10 best clones were based on 7-year growth at the Nursery and on 9-year growth at Horseshoe Run. 7-year data from Horseshoe Run also are shown.

[2]Figures in parentheses are for clones that were not among the 10 best at the designated site but were among the 10 best at the other site.

Table 3.--Clones that failed completely or grew at a rate of less than 1.5 feet per year

Horseshoe Run	Parsons Nursery
Clone number	Clone number
NE- 9	NE- --
10	10
--	12
14	--
18	18
31	31
33	33
34	34
205	205
224	--
227	227
229	229
--	235
239	239
261	--
264	264
282	282
301	301
305	305
--	333

Of the 50 clones used in the test, seven appear to have done well enough to be recommended for planting under similar climatic conditions on soils of low pH in West Virginia. They are NE-41, 46, 47, 49, 50, 51, and 52. These clones all grew at an average rate of 3.6 feet per year or better for 9 years on the well-drained Horseshoe Run site; all are hybrids of P. maximowiczii.

The largest single tree in the planting was found at Horseshoe Run; it was of clone NE-50, whose parents were a P. maximowiczii and the cultivar P. x berolinensis. Height and diameter of this tree at the end of the ninth growing season were 50 feet and 6.1 inches, respectively.

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